4 HDMI to DVB-T Encoder Modulator
User's Manual

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HW version: 5.0

Web NMS version: 4.09

4*HDMI to DVB-T Encoder Modulator

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Chapter 1 Introduction

1.1 Product Overview

HDMI TO DVB-T Modulator is a MPEG4/AVC H.264 encoding and DVB-T modulation integrated device to convert HDMI signals to DVB-T RF out in the frequency range of 30~960MHz. It has equipped with 4 channels HDMI input and 1ASI input.

The signals source could be from satellite receivers, closed-circuit television cameras, Blue-ray players, and antenna etc. its output signal is to be received by a DVB-T standard TV, DVB-T STB.

The device can be used in public places such as metro, market hall, theatre, hotels, resorts, etc for advertising. It also can be used for monitoring, training and educating in company, schools, campuses, hospital… Besides, it's a good choice for bars to offer HD sports channels, for VIP entertainment channels, and more.

1.2 Key features

- 1920*1080@50P/60P Full HD support
- MPEG4/AVC H.264 encoding
- 4* HDMI in, 1 ASI in, 1*RF in
- 2 ASI output, RF COFDM DVB-T output
- LCN support (Logical Channel Number)
- Excellent modulation quality MER≥42dB
- RF Frequency range 30Mhz~960Mhz
- LCD display, Remote control and firmware
- Updates via web/Ethernet
- Lowest cost per channel --- breakthrough price

1.3 Specification

Encoding section

Video

Encoding	H.264/AVC High Profile Level 4.0(HD)
Input	HDMI*4
Resolution	1920*1080_60P, 1920*1080_50P, 1920*1080_60i, 1920*1080_50i, 1280*720_60p, 1280*720_50P

Audio

encoding	MPEG1 Layer II
Sample rate	48KHz
Bit rate	64kbps, 96kbps,128kbps, 192kbps, 256kbps, 320kbps

DVB-T modulator section

Standard	EN300744
FFT mode	2K, 8K
Bandwidth	6M,7M,8M
Constellation	QPSK, 16QAM, 64QAM
Guard Interval	1/4, 1/8, 1/16, 1/32
FEC	1/2, 2/3, 3/4, 5/6, 7/8
MER	≥42dB
RF frequency	30~960MHz, 1KHz step
RF output level	-30~ -10dbm(81~97 dbμV), 0.1db step

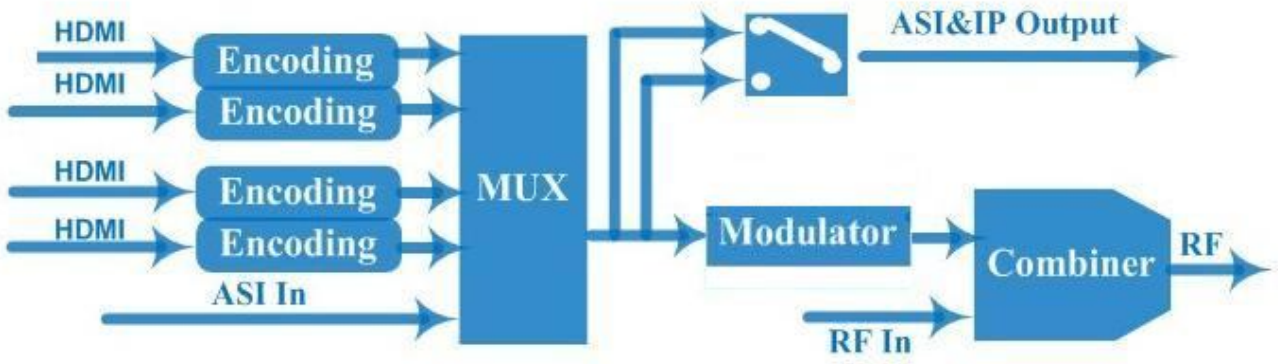
Interface

Local interface	LCD + control buttons
Remote management	Web NMS
Language	English

General

Power supply	AC 100V~240V
Dimensions	482*300*44mm
Weight	4.5kgs
Operation temperature	0~45℃

1.4 Principle chart



1.5 Appearance and Description

Front Panel Illustration

① **LCD window: LCD display**
② **NMS & DATA ports**
③ **Power and Alarm Indicators**
④ **Lock Indicators**
⑤ **Up and down, left and right button**
⑥ **Enter button: for confirm**
⑦ **Menu button: for back step**
⑧ **Lock button: press to lock set**

Rear Panel Illustration

① **HDMI input port 1,2**
② **HDMI input port 3,4**
③ **RF in**
④ **RF out**
⑤ **ASI input**
⑥ **ASI output**
⑦ **Switch**
⑧ **Power supply slot**
⑨ **Grounding**

Chapter 2 Installation Guide

This section is to explain the cautions the users must know in some case that possible injure may bring to users when it's used or installed. For this reason, please read all details here and make in mind before installing or using the product.

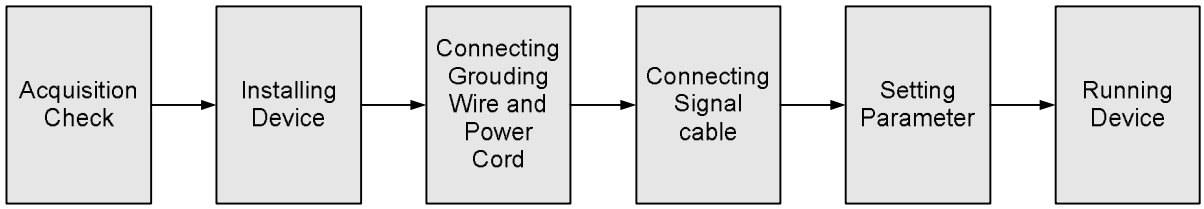
2.1 General Precautions

- ✓ Must be operated and maintained free of dust or dirty.
- ✓ The cover should be securely fastened, do not open the cover of the products when the power is on.
- ✓ After use, securely stow away all loose cables, external antenna, and others.

2.2 Power precautions

- ✓ When you connect the power source, make sure if it may cause overload.
- ✓ Avoid operating on a wet floor in the open. Make sure the extension cable is in good condition
- ✓ Make sure the power switch is off before you start to install the device

2.3 Device's Installation Flow Chart Illustrated as following



2.4 Environment Requirement

Item	Requirement
Machine Hall Space	When user installs machine frame array in one machine hall, the distance between 2 rows of machine frames should be

	1.2~1.5m and the distance against wall should be no less than 0.8m.
Machine Hall Floor	Electric Isolation, Dust Free Volume resistivity of ground anti-static material: $1X10^{7}$~$1X10^{10}\Omega$，Grounding current limiting resistance: 1MΩ (Floor bearing should be greater than 450Kg/㎡)
Environment Temperature	5~40℃(sustainable)，0~45℃(short time)， installing air-conditioning is recommended
Relative Humidity	20%~80% sustainable 10%~90% short time
Pressure	86~105KPa
Door & Window	Installing rubber strip for sealing door-gaps and dual level glasses for window
Wall	It can be covered with wallpaper, or brightness less paint.
Fire Protection	Fire alarm system and extinguisher
Power	Requiring device power, air-conditioning power and lighting power are independent to each other. Device power requires AC 110V±10%, 50/60Hz or AC 220V±10%, 50/60Hz. Please carefully check before running.

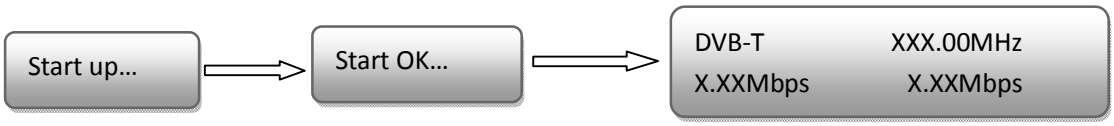
2.5 Grounding Requirement

- ✓ All function modules' good grounding is the basis of reliability and stability of devices. Also, they are the most important guarantee of lightning arresting and interference rejection. Therefore, the system must follow this rule.
- ✓ Grounding conductor must adopt copper conductor in order to reduce high frequency impedance, and the grounding wire must be as thick and short as possible.
- ✓ Users should make sure the 2 ends of grounding wire well electric conducted and be antirust.
- ✓ It is prohibited to use any other device as part of grounding electric circuit
- ✓ The area of the conduction between grounding wire and device's frame should be no less than 25 ㎡.

Chapter 3 Operation

3.1 Initial Status

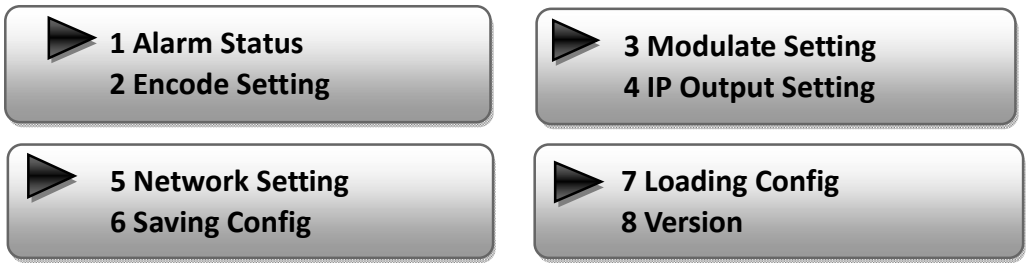
Switch on the device then below status will be displayed. Few seconds' initialization, it presents startup pictures as below.



- DVB-T: indicate the modulation standard of this device
- XXX.XX MHz indicates the output frequency, and the frequency range is 30~960MHz
- X.XX Mbps indicate the encoding bit rate of channel 1&2 respectively.

3.2 General setting for Main Menu

By pressing "Lock" key on the front panel, user can enter the main menu. The LCD will display the following pages:



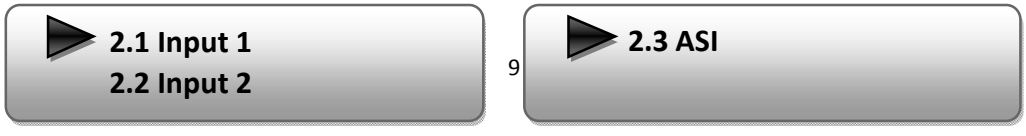
User can press UP/DOWN buttons to specify menu item, and then press ENTER to enter the submenus as below:

1) Alarm Status

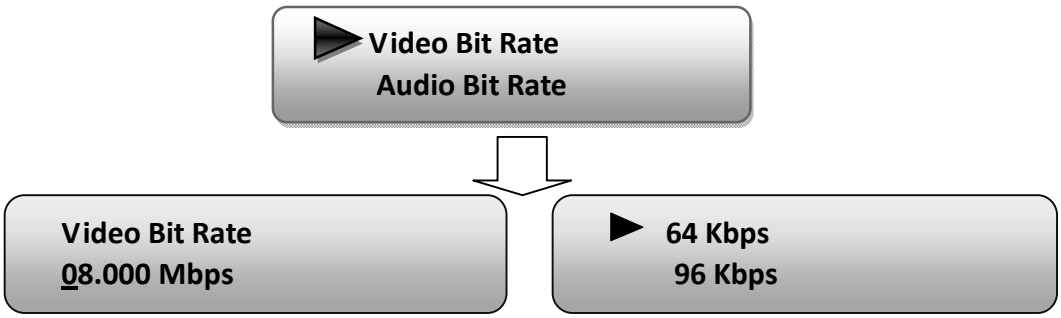
The alarm indicator will turn on if there is no A/V signals inputting or outputting bit rate overflows. User then can enter this menu to check the error type.

2) Encode Setting

Under this submenu, the LCD will show "2.1 Input 1", "2.2 Input 2" and "2.3 ASI".



Under submenu 2.1 and 2.2, user could set the audio and video encoding bit rate.



Under submenu 2.3, user could parse the inputting programs and select the programs to output.

3) Modulate Setting

When entering "Modulator Setting" submenu, user can find below different parameters can be set and the LCD window would show as below:

- **Bandwidth**

  There are three possible options provided for selecting bandwidth: 6M, 7M, and 8M. When the display shows them, user just need swift LEFT and RIGHT key to choose and repressing ENTER to confirm.

- **Constellation**

  There are three different constellations QPSK, 16QAM and 64QAM shown on the LCD window. When entering Constellation, user can apply the same setting method as mentioned above to select and confirm one mode.

- **Transmission Mode**

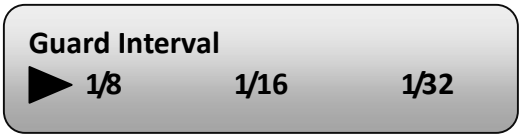
  When user enters Transmission Mode, the LCD would show the current working mode. User can move LEFT/RIGHT keys to select and press ENTER key to confirm. 2K and 8K are the options:

2K: When the device works as current mode, the number of current carrier is 2048

8K: When the device works as current mode, the number of current carrier is 8192

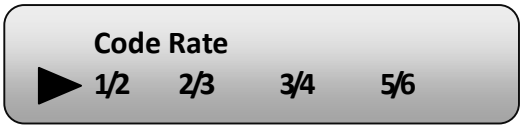
- **Guard Interval**

In communications, guard intervals are used to ensure that distant transmissions do not interfere with each other. These transmissions may belong to different users (as in TDMA) or same user (as in OFDM). The purpose of the guard interval is to introduce immunity to propagation delays, echoes and reflections, to which digital data is normally very sensitive. There are four possible options provided to be selected. They are 1/4, 1/8, 1/16, 1/32. User can shift the LEFT/RIGHT keys to select and press ENTER to confirm.



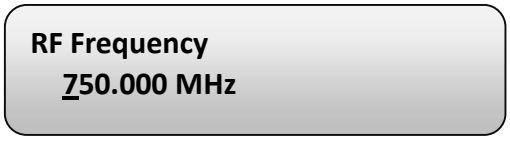
- **Code Rate**

The code rate includes 1/2, 2/3, 3/4, 5/6, and 7/8. After entering this submenu, the LCD display would show them, users just need press LEFT and RIGHT buttons to choose and press ENTER button to confirm.



- **RF Frequency**

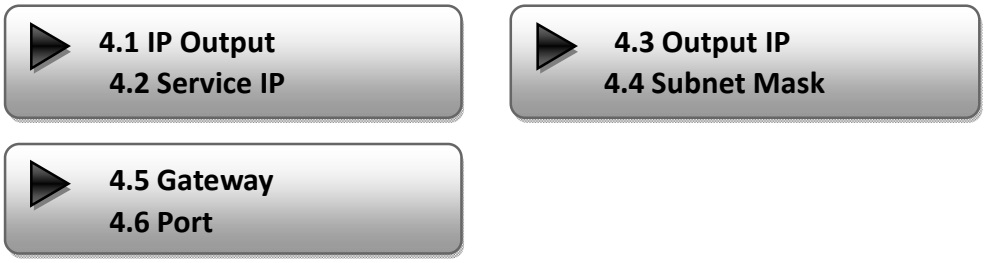
The RF output frequency range is from 30 to 1000MHz with 1K stepping. After entering the RF frequency setting submenu, users the can press LEFT, RIGHT, UP, and DOWN buttons to adjust the frequency and confirm by press ENTER button.



- **RF Out Level**

The RF attenuation range is -30~-10dbm (81~97dbμV) with 0.1db step. After entering this setting submenu, user can shift UP/DOWN/LEFT/RIGHT key to set the output level and press ENTER to confirm.

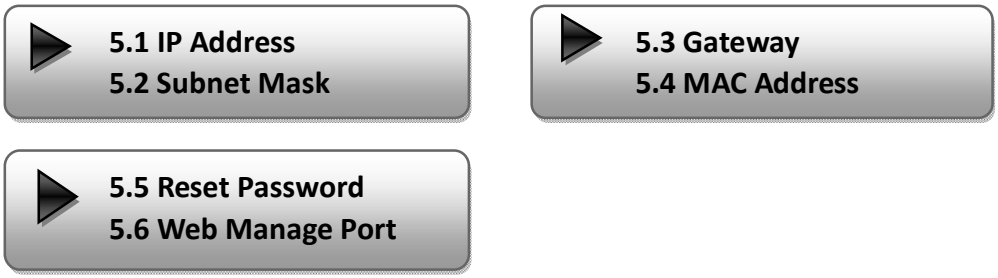
4) IP Output Setting



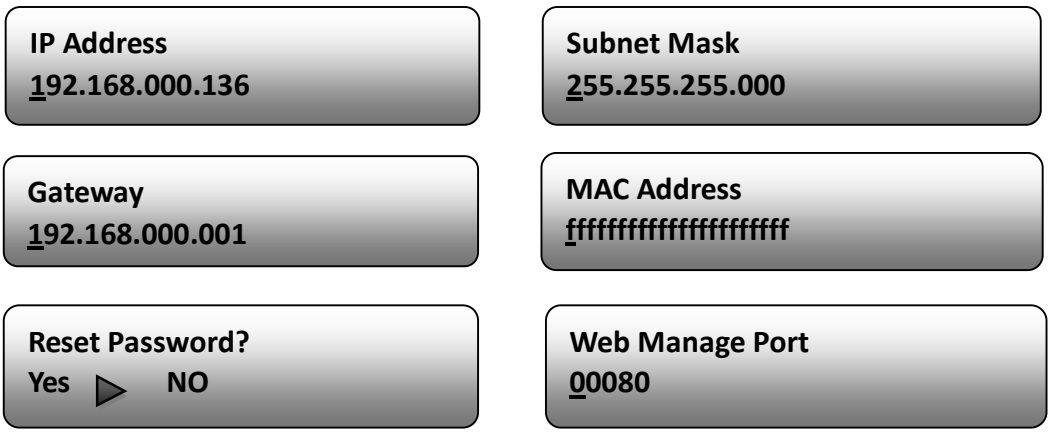
User can enter 4.1 to decide whether to turn the IP port on or off, and enter to the rest menu items to set the corresponding parameters.

5) Network setting

After enter Network Setting, there are three submenus shows as the following LCD displays.



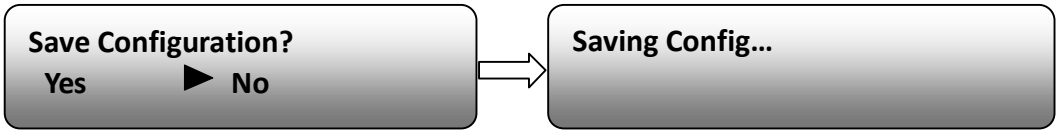
User can press "UP/DOWN" to choose this item and "ENTER" & "LEFT/RIGHT" to set the parameters.



Note: The MAC address is according to the factory setting, and it is unique.

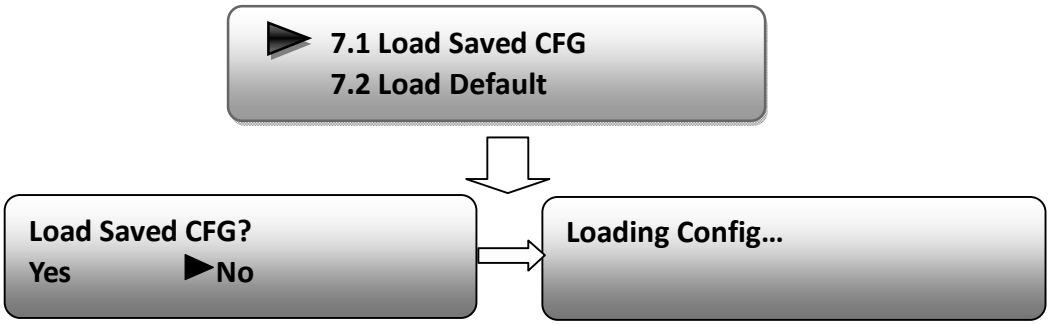
6) Saving Configuration

Users enter Saving Configuration submenu for saving settings. Choose yes for confirm set.



7) Loading Configuration

At this menu, user can press UP/DWON key to select and repress ENTER to confirm. User can restore the device into the last saved configuration by choosing "7.1" and restore the device into factory configuration by choosing "7.2" the display will show as below:



8) Version

User can check the software version and hardware version of this equipment under this submenu.

Chapter 4 WEB NMS operation

User not only can use front buttons for setting configuration, but also can control and set the configuration in computer by connecting the device to web NMS Port. User should ensure that the computer's IP address is different from the HDMI TO DVB-T MODULATOR's IP address; otherwise, it would cause IP conflict.

4.1 login

The default IP of this device is 192.168.0.136. We can modify the IP through the front panel.

Then connect the pc and the device with net cable, and use ping command to confirm they are on the same network segment.

Say the PC IP address is 192.168.99.252, so we change the device IP to 192.168.99.xxx (xxx can be 0 to 255 except 252 to avoid conflict with PC IP address), then we need to use web browser to connect the device with our PC.

Put the IP of the device in the browser and enter.

When we connect the device, it will display Login screen as Figure-1. Input the Username and Password (Both the default Username and Password are "admin".) then click on 'Login' to start the device setting.

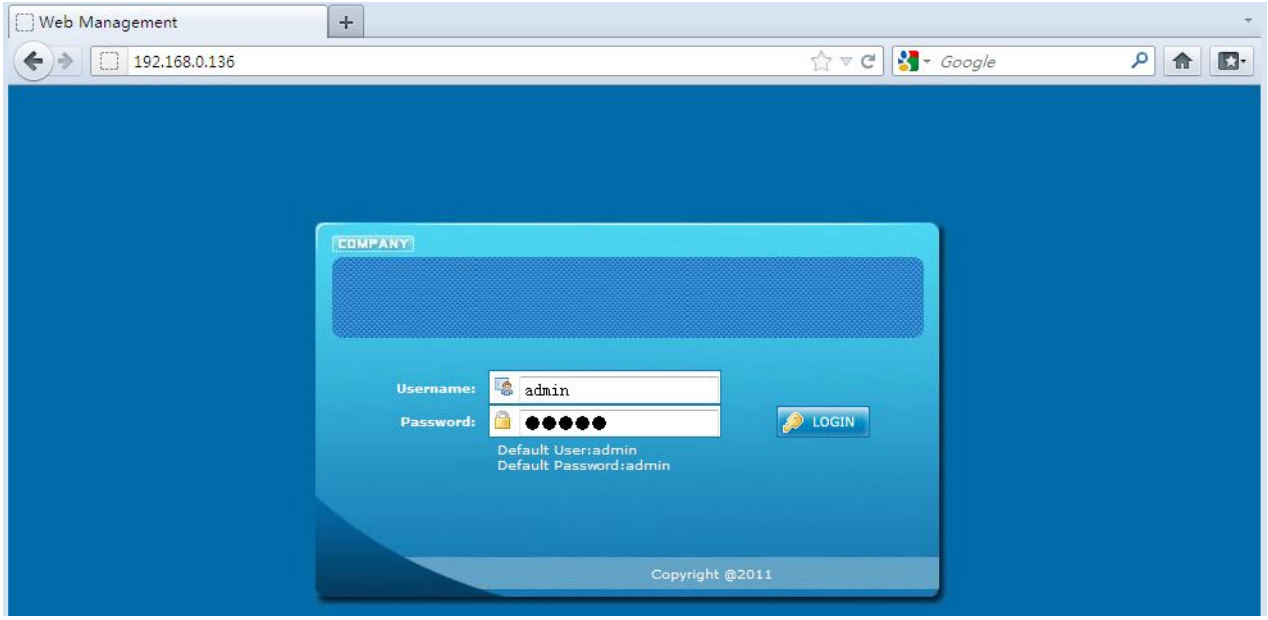


Figure-1

4.2 Operation

When we confirm the login, it displays the screen as Figure-2.

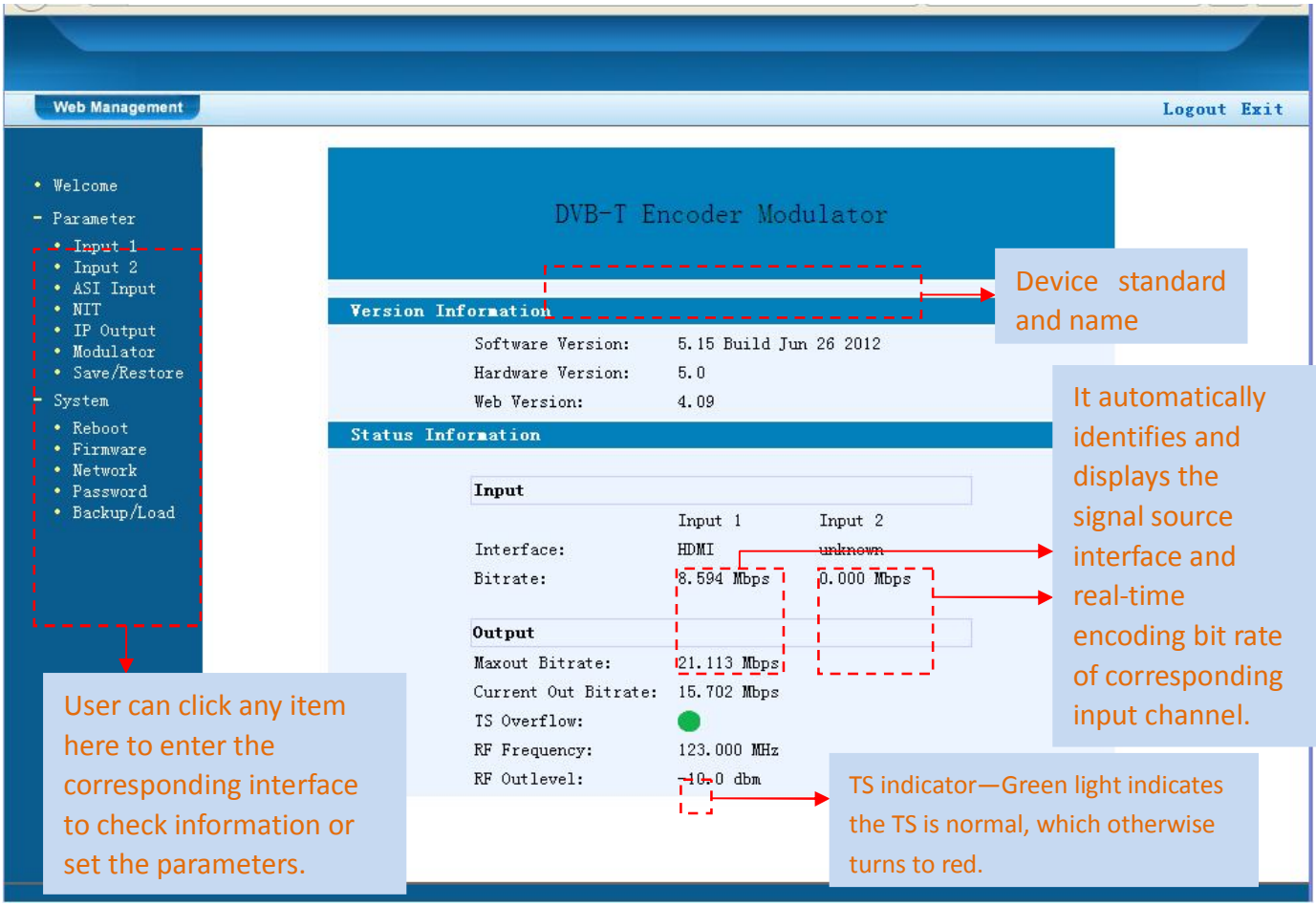


Figure-2

Input 1/2

From the left side menu of the webpage, clicking on “Input 1”, it displays the 1st HDMI IN programs input information as Figure-3.

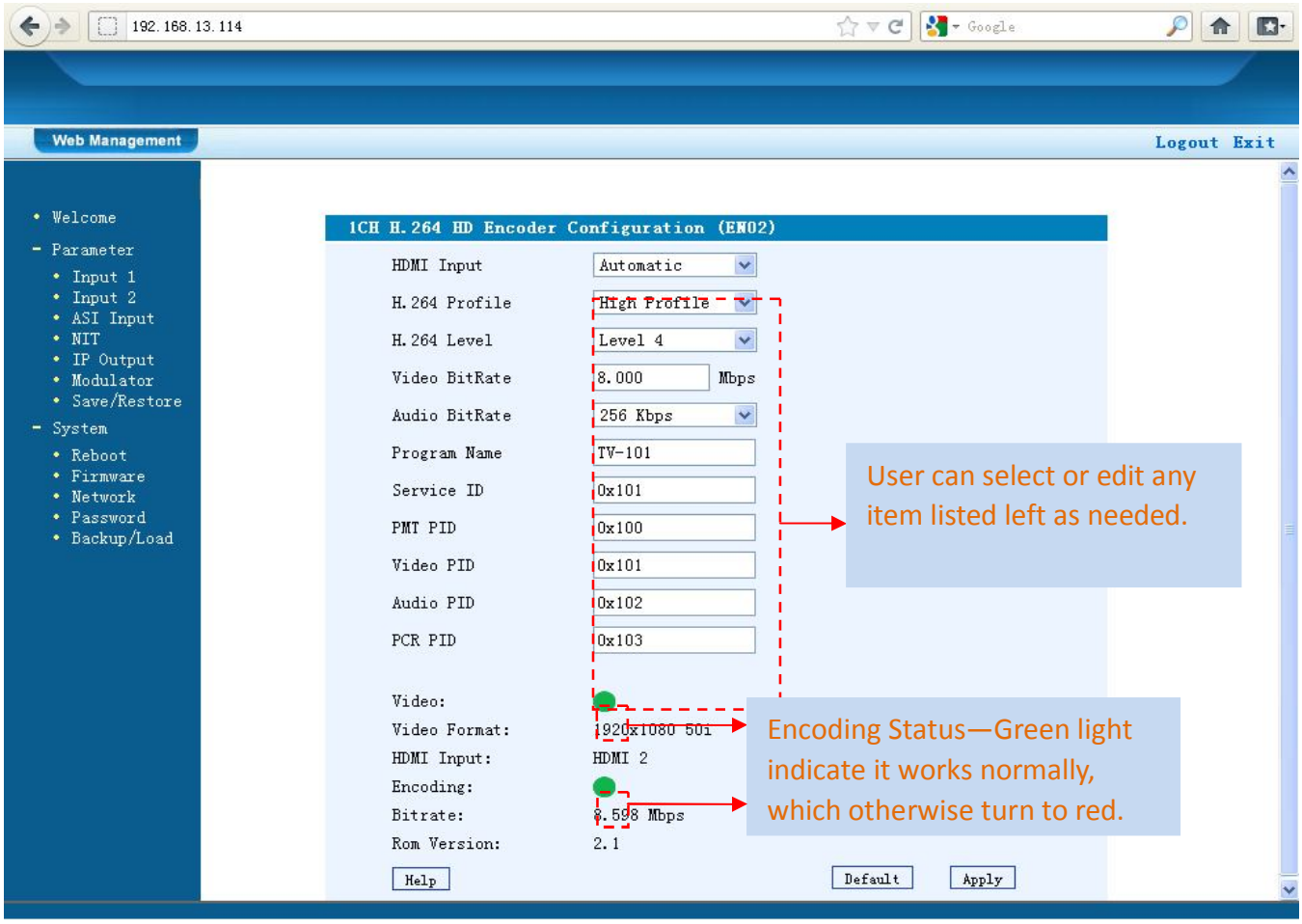


Figure-3

Help For user to turn to refer detailed explanation of terms on this interface

Default Click this button to apply the default setting of Input 1

Apply Click this button to apply the modified parameters.

Same like “Input 1”, when clicking “Input 2”, it will display another HDMI IN program input information.

ASI Input

When clicking “ASI Input”, it will display ASI input programs information as Figure-4.

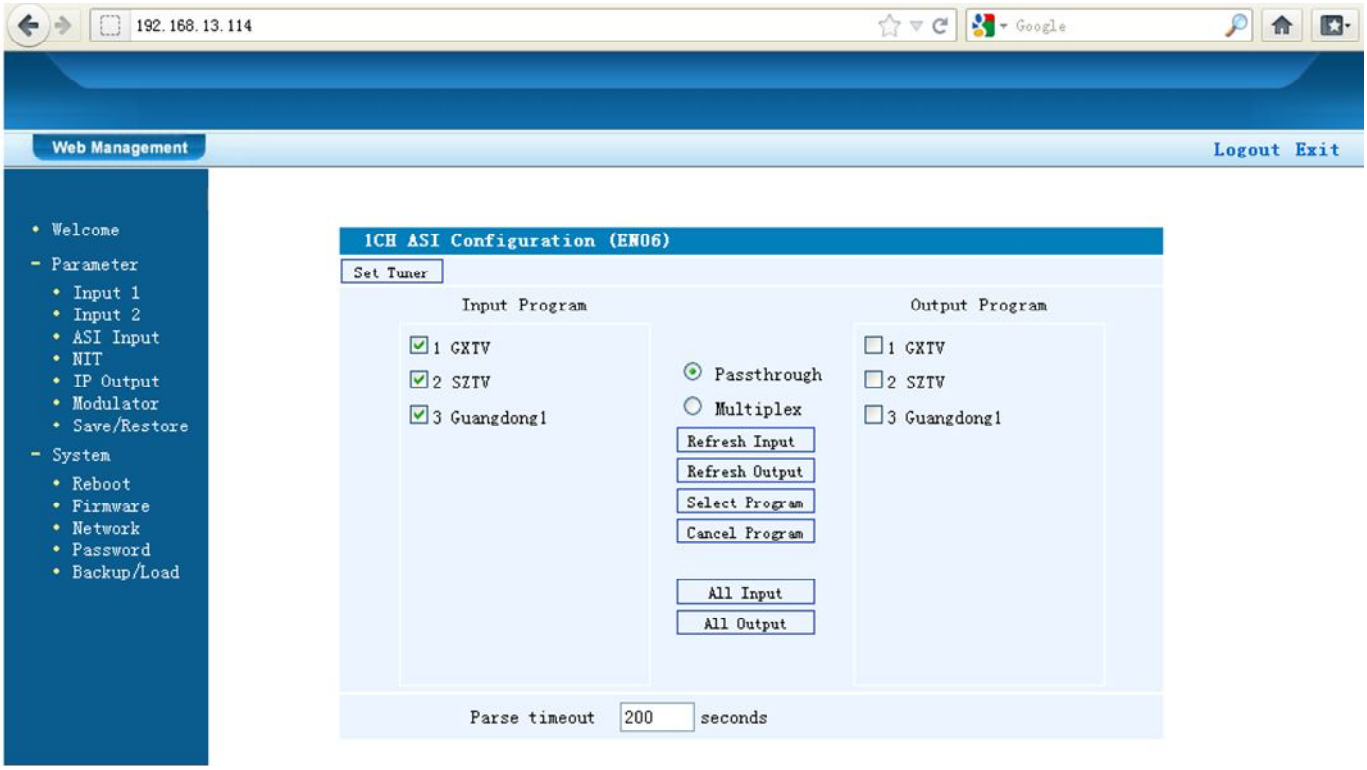


Figure-4

Passthrough If this item is selected, all the input programs will pass through without any elimination.

Multiplex Selecting this item to allow user select programs as required to output.

Refresh Input Click on "Refresh Input" to refresh the input program list.

Refresh Output Click on "Refresh Output" to refresh the output program list.

Select Program When user checks one input program with "√", one can transfer the checked program to the right box to output.

Here user can select the programs which we want to output or we can output all the programs.

Cancel Program Similarly, user can cancel the multiplexed programs from the right box.

All Input & All Output to select all the input/output programs with one-time clicking.

Parse timeout 200 seconds Time limitation to parse the input programs.

NIT Table setting

When user clicks on NIT from the menu, it will display the screen as Figure-5. Then user needs to click on “Add” from this screen to add the program descriptor in NIT Table.

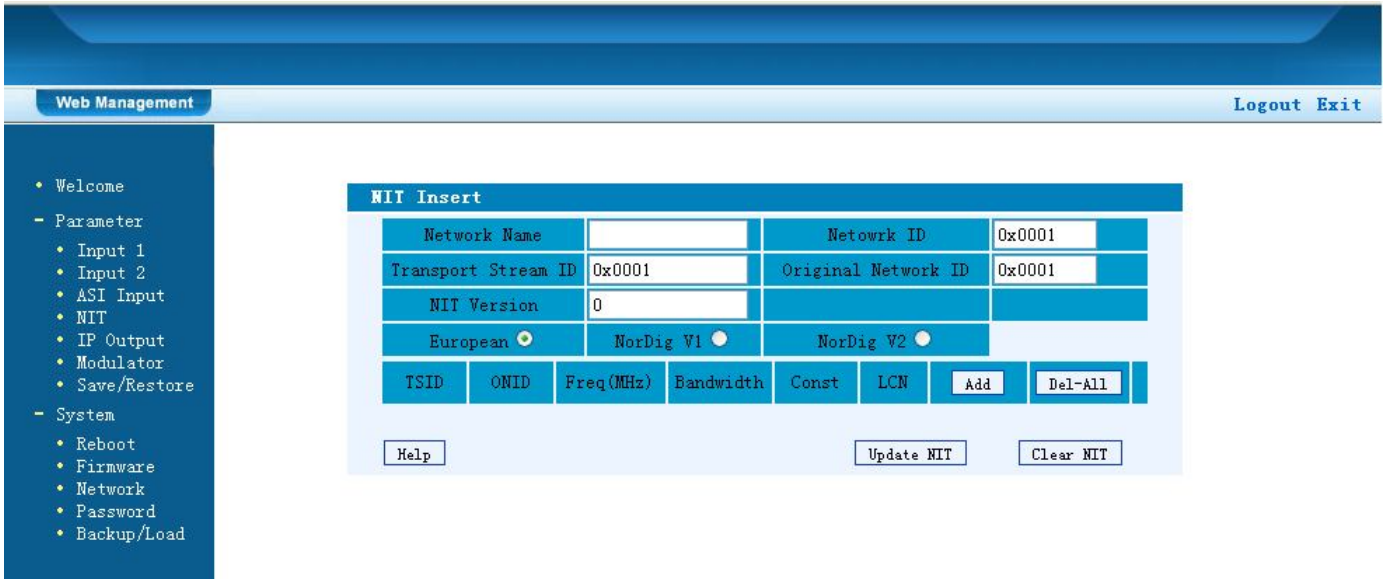


Figure-5

When user clicks on “Add” from this page, it will display the screen as Figure-6. Here user has to add Service ID for the programs.

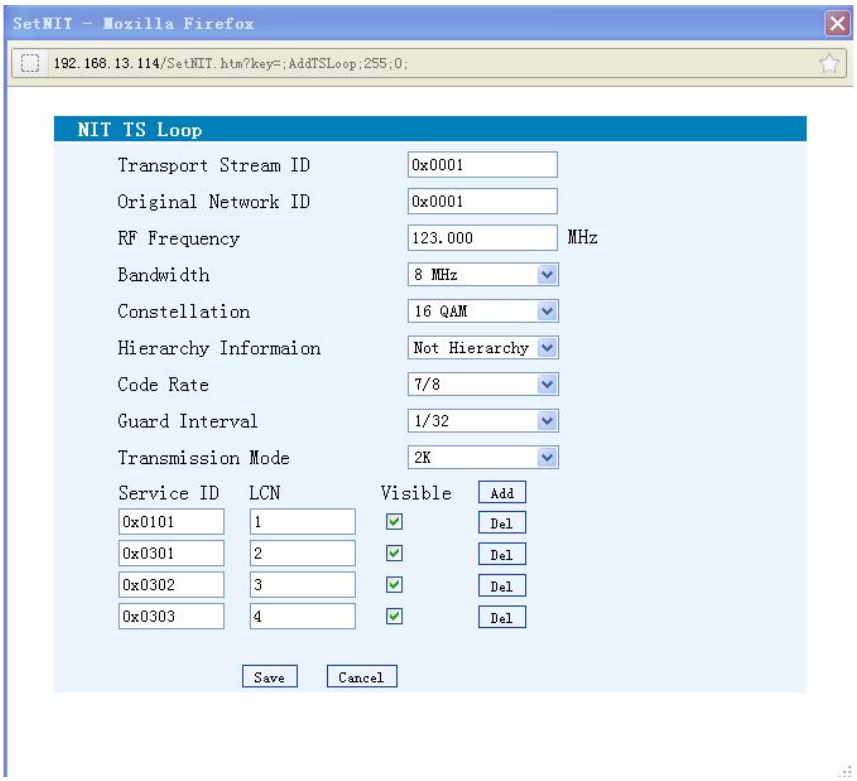


Figure-6

Here by clicking on “Add”, users can set the program LCN in its respective field. After setting all the data, users need to click on “Save” to save the setting. After setting all the data click on “Save” to save the setting. Then as in Figure-7 below we need to click on

“Update NIT” to update the NIT information.

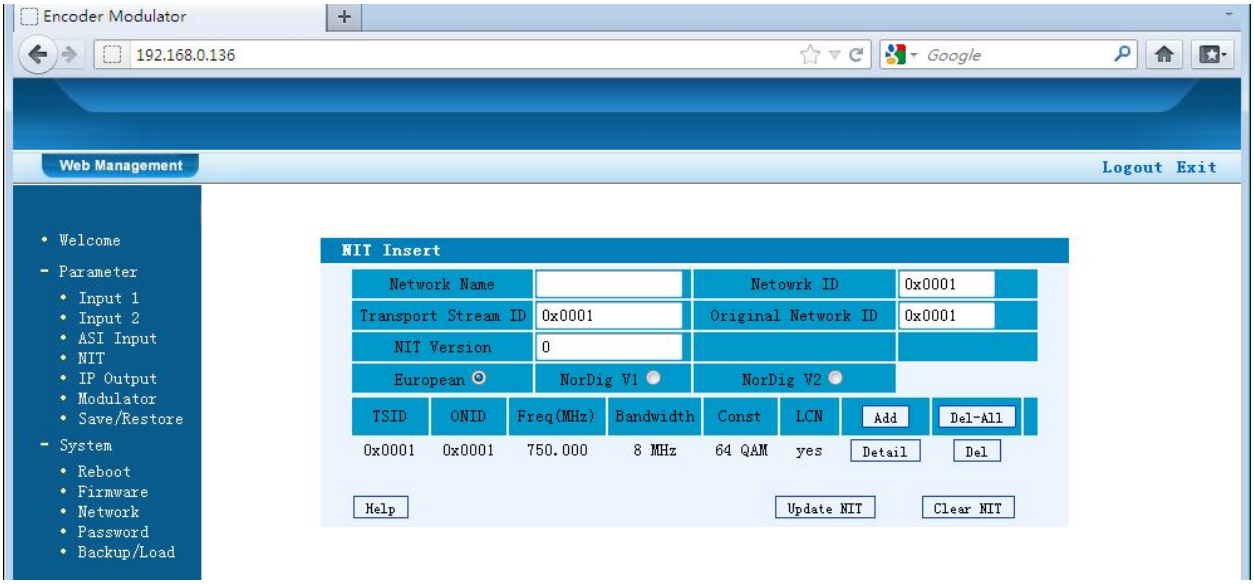


Figure-7

IP Output

When user clicks on ‘IP Output’ from the menu, it will display the screen as Figure-8. Here user can set the multicast IP Output address for the device if we need. After setting the parameter we need to click on “Apply” to save the setting.

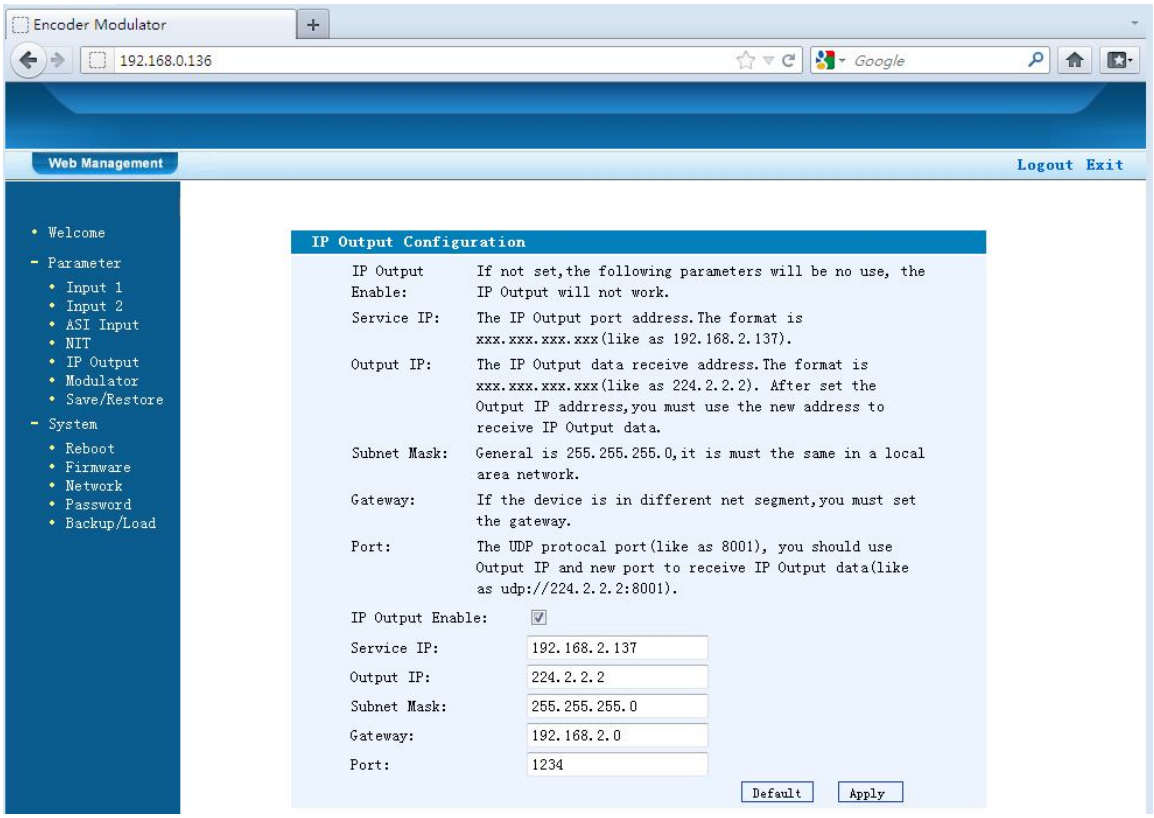


Figure-8

Modulator Setting

When entering in “Modulator”, it will display the Modulator Configuration screen as Figure-9. Here user can set modulation parameters.

Bandwidth – The Bandwidth we have to choose. (The default bandwidth is 8M)

Constellation – Choose the QAM type. (The default constellation is 16 QAM)

Transmission Mode –.2K, 8K optional

Guard Interval/Code Rate/RF Frequency/RF Out level – the default configuration is as shown on Figure 8.

After setting all the parameters, user needs to click on “Apply” to save the Modulator parameters.

Figure-9

Save/Restore

When user clicks on “Save/Restore” from the menu, it will display the screen as Figure-10. Here user can save the configuration parmanently to the device. Click on “Save Configuration”, for store the data permanently to the device.

By using “Restore Configuration” user can restore the the latest saved configuration to the device.

By using “Factory Set” user can import the default factory configuration.

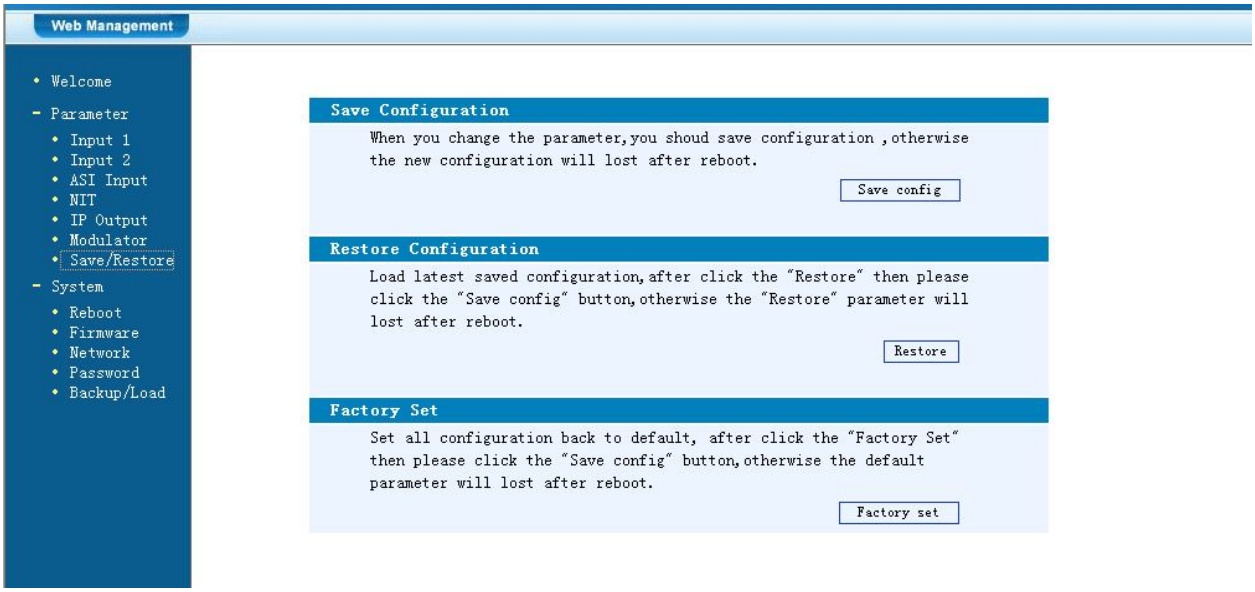


Figure-10

Restart the Device

When user clicks on “Reboot” from the menu, the screen will display as Figure-11. Here when user clicks on “Reboot” box, it will restart the device autometically.

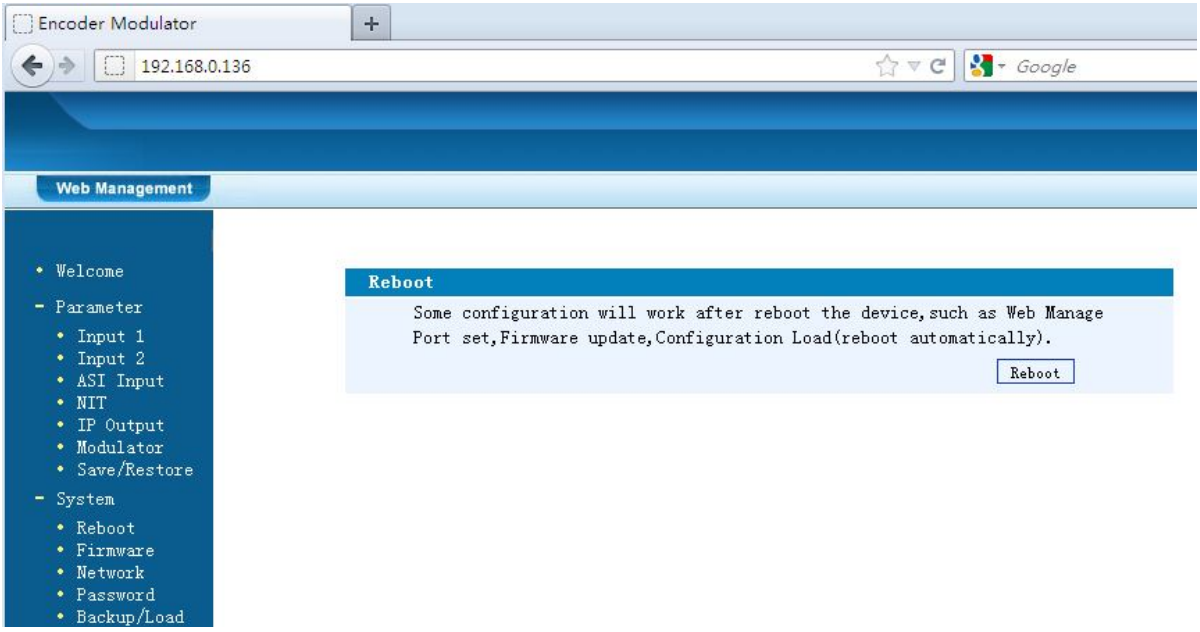


Figure-11

Update the Device

When user clicks on “Firmware” from the menu it will display the screen as Figure-12. Here user can update the device by using the update file.

Click on “Browse” to find the path of the device update file for this device then click on “Update” to update the device.

After updating the device, user needs to restart the device by using Reboot option.

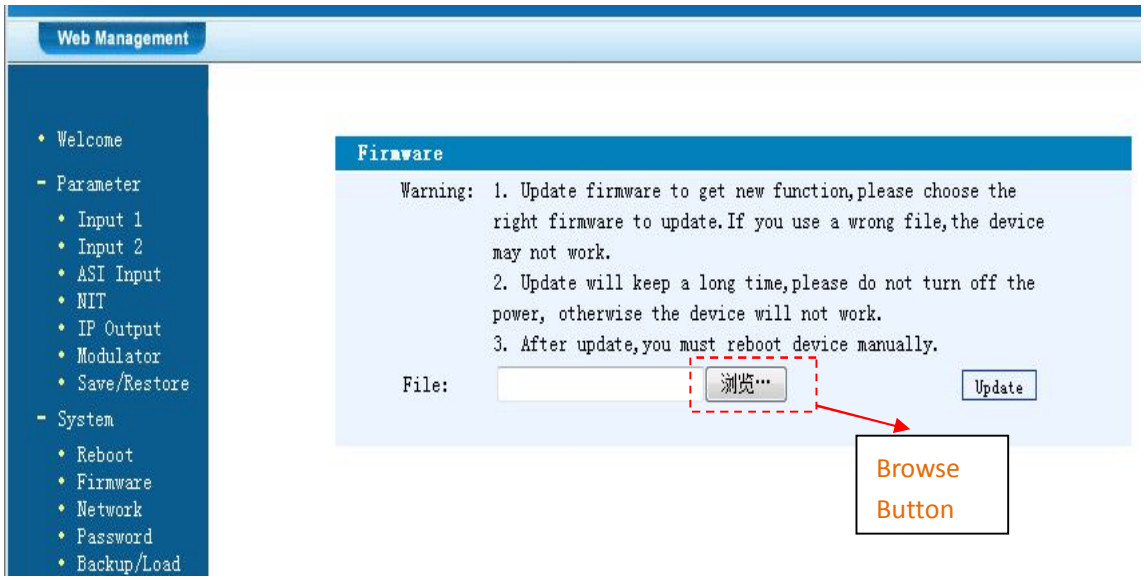


Figure-12

Network

When user clicks on "Network", it will display the screen as Figure-13. It display the network information of the device. Here user can change the device network configuration as needed.

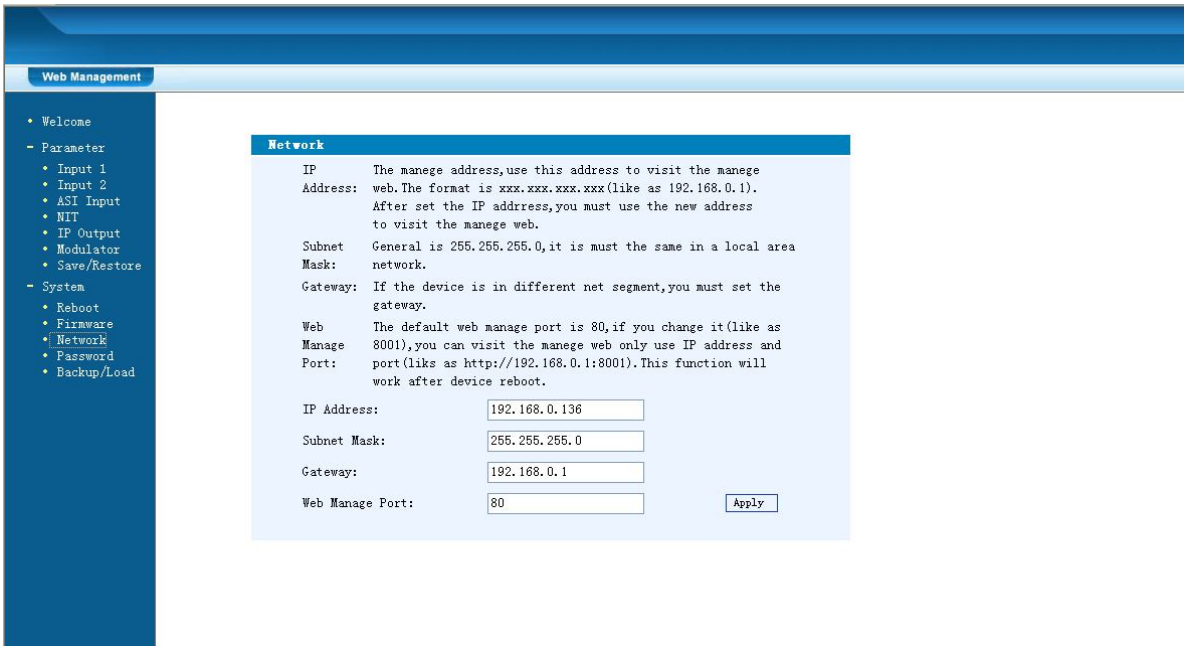

Web Management
Welcome
Parameter
Input 1
Input 2
ASI Input
NIT
IP Output
Modulator
Save/Restore
System
Reboot
Firmware
Network
Password
Backup/Load
Network
IP Address: The manege address, use this address to visit the manege web. The format is xxx.xxx.xxx.xxx (like as 192.168.0.1). After set the IP addrress, you must use the new address to visit the manege web.
Subnet Mask: General is 255.255.255.0, it is must the same in a local area network.
Gateway: If the device is in different net segment, you must set the gateway.
Web Manage Port: The default web manage port is 80, if you change it (like as 8001), you can visit the manege web only use IP address and port (liks as http://192.168.0.1:8001). This function will work after device reboot.
IP Address: 192.168.0.136
Subnet Mask: 255.255.255.0
Gateway: 192.168.0.1
Web Manage Port: 80
Apply

Figure-13

Change Password

When user clicks on "Password", it will display the password screen as Figure-14. Here user can change the Username and Password for login to the device.

User needs to put old Username and Password then to put new Username and Password.

After putting the parameters, user needs to click on “Apply” to save the configuration.

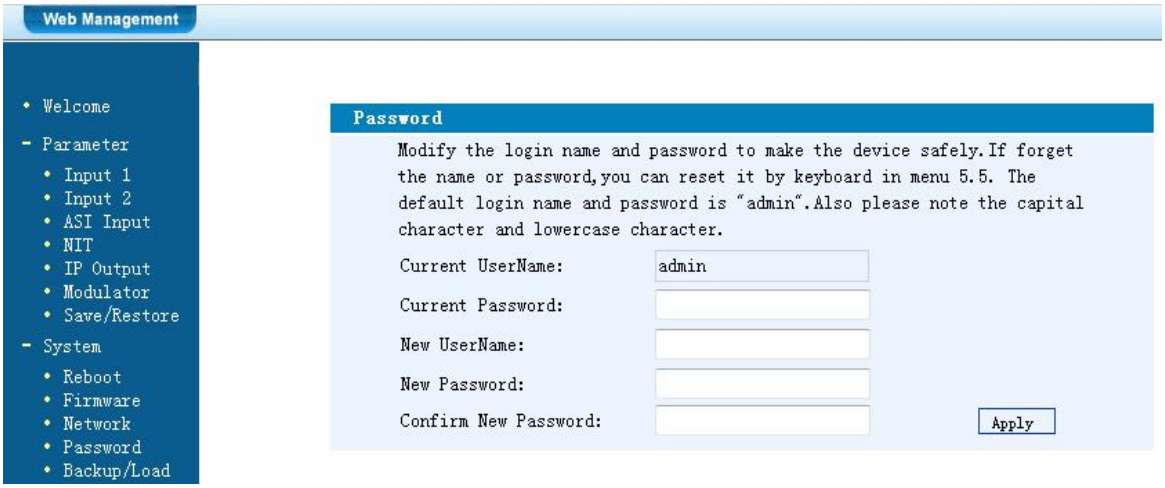


Figure-14

Backup/Load

When user clicks on “Backup/Load” from the menu, it will display the screen as Figure-15.

Backup Configuration – Here user can back up the device configuration file to a folder by clicking on “Backup Configuration”.

Load Configuration – If user needs to load the old configuration to the device, one can click on “Browse” and find the backup configuration file path. After selecting the file, user needs to click on “Load File” to load the backup file to the device.

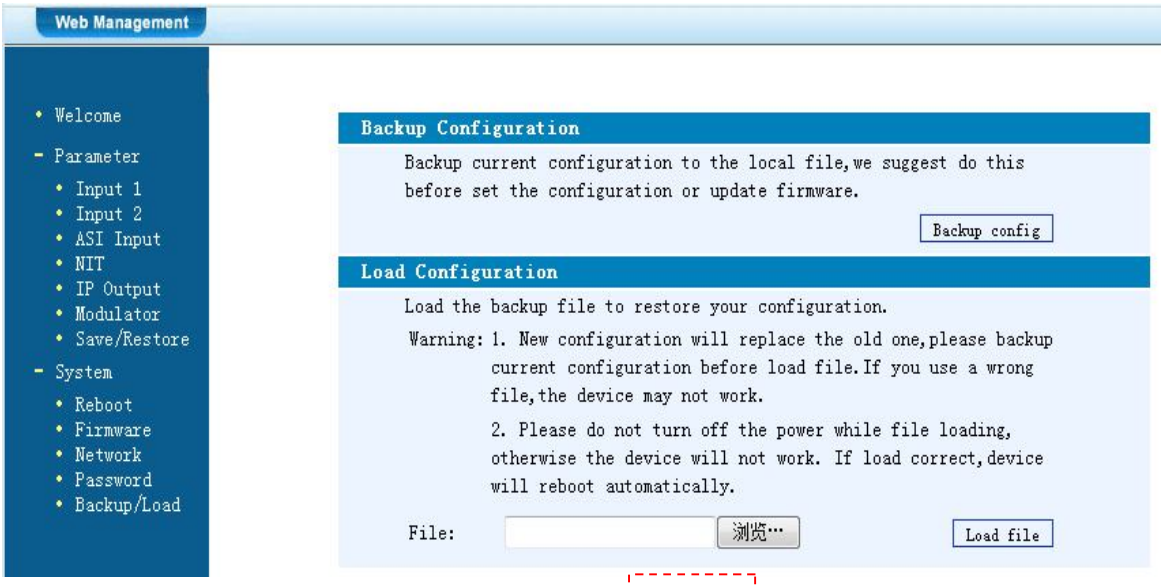
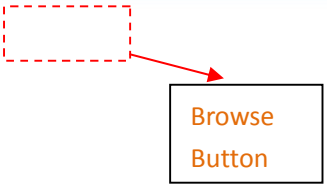

Web Management
Welcome
Parameter
Input 1
Input 2
ASI Input
NIT
IP Output
Modulator
Save/Restore
System
Reboot
Firmware
Network
Password
Backup/Load
Backup Configuration
Backup current configuration to the local file, we suggest do this before set the configuration or update firmware.
Backup config
Load Configuration
Load the backup file to restore your configuration.
Warning: 1. New configuration will replace the old one, please backup current configuration before load file. If you use a wrong file, the device may not work.
2. Please do not turn off the power while file loading, otherwise the device will not work. If load correct, device will reboot automatically.
File:
浏览…
Load file

Figure-15



Chapter 5 Troubleshooting

Prevention Measure

- Installing the device at the place in which environment temperature between 0 to 45 °C
- Making sure good ventilation for the heat-sink on the rear panel and other heat-sink bores if necessary
- Checking the input AC within the power supply working range and the connection is correct before switching on device
- Checking the RF output level varies within tolerant range if it is necessary
- Checking all signal cables have been properly connected
- Frequently switching on/off device is prohibited; the interval between every switching on/off must greater than 10 seconds.

Conditions need to unplug power cord

- Power cord or socket damaged.
- Any liquid flowed into device.
- Any stuff causes circuit short
- Device in damp environment
- Device was suffered from physical damage
- Longtime idle.
- After switching on and restoring to factory setting, device still cannot work properly.
- Maintenance needed

Chapter 6 Packing List

HDMI TO DVB-T encoder Modulator	1PC
User's Manual	1PC
HDMI Cables	4PCS
Power Cord	1PC

Chapter 7 Application

7.1 Ordering guideline

Our design is individual module, for this series device the encoding module including five version for optional

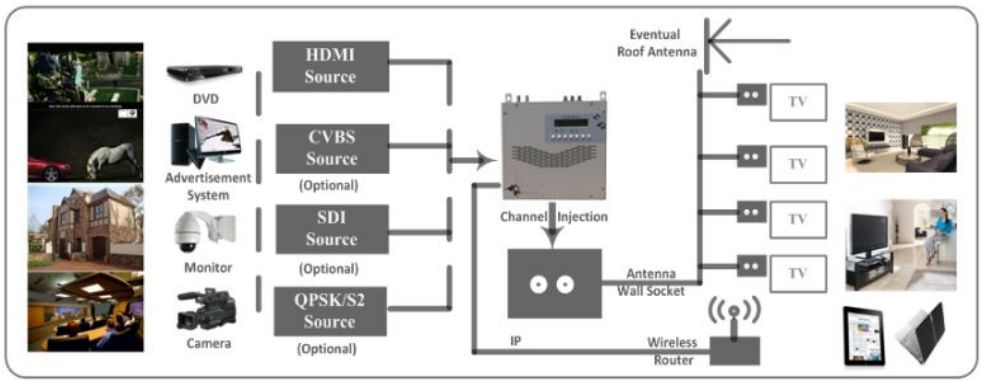
- ✓ MPEG2 SD encoding with 1 CVBS module
- ✓ MPEG2 SD super encoding with 2 CVBS module
- ✓ MPEG4 AVC H.264 encoding with 1 SDI module
- ✓ MPEG4 AVC H.264 encoding with 1 HDMI module
- ✓ DVB-S2 tuner input module

Modulation module including three version for optional

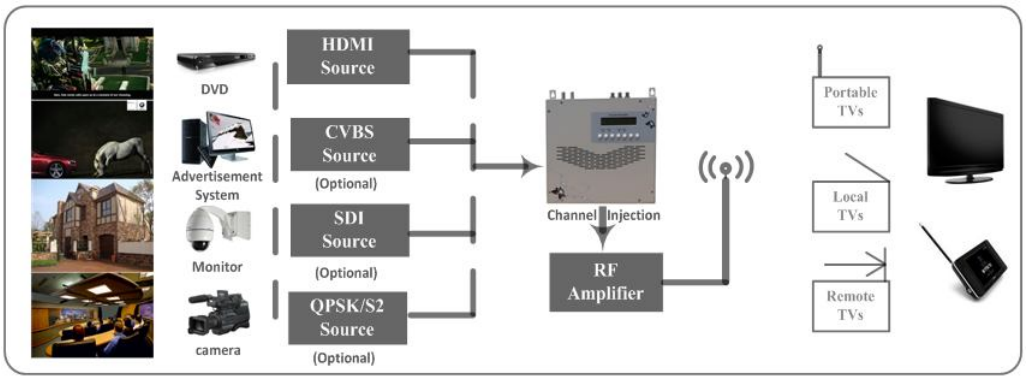
- ✓ ISDB-T RF out module
- ✓ DVB-T RF out module
- ✓ DVB-T COFDM RF out module

7.2 application example

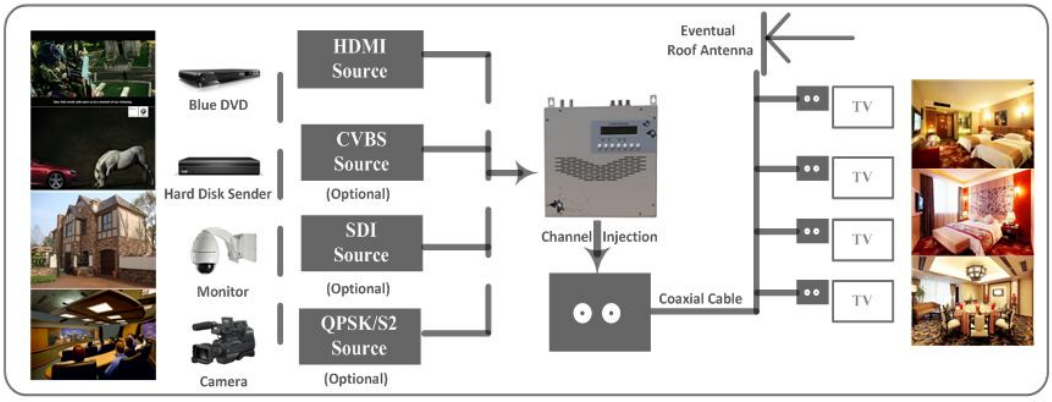
1). Residences and Private Homes Video content DVB-T/ISDB-T distribution



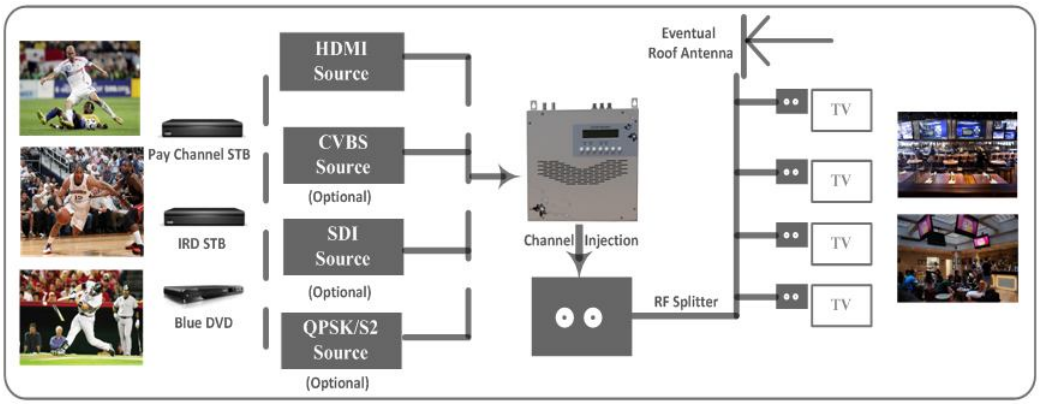
2) Outside Audio - Video contents ON - AIR DVB - T/ISDB-T distribution



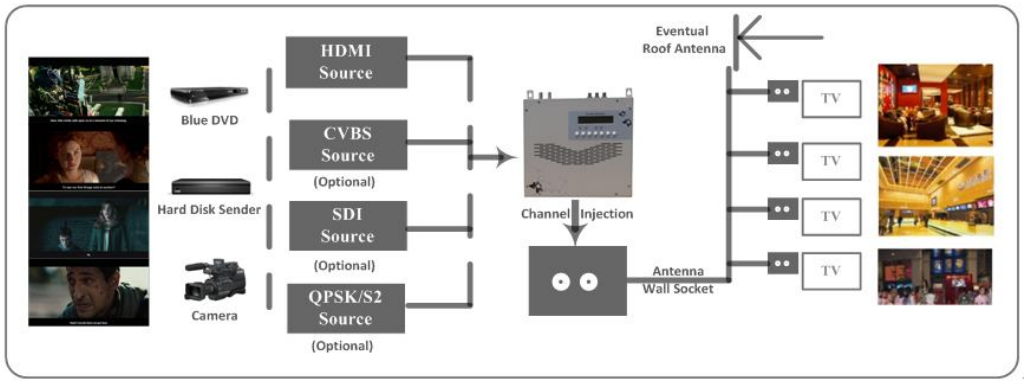
3) Hotel Audio - Video contents DVB - T/ISDB-T distribution



4) Bar Audio - Video contents distribution



5) Cinema Audio - Video contents DVB - T/ISDB-T distribution



6) Company Audio - Video contents distribution